

SEQUENCE LISTING

(1) GENERAL INFORMATION:

- (i) APPLICANT: Muller, Martin  
Gissmann, Lutz
- (ii) TITLE OF INVENTION: Seroreactive Regions on HPV 16 Proteins  
E1 and E2
- (iii) NUMBER OF SEQUENCES: 44
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  - (E) COUNTRY: USA
  - (F) ZIP: 20005-3315
- (v) COMPUTER READABLE FORM:
  - (A) MEDIUM TYPE: Floppy disk
  - (B) COMPUTER: IBM PC compatible
  - (C) OPERATING SYSTEM: PC-DOS/MS-DOS
  - (D) SOFTWARE: PatentIn Release #1.0, Version #1.25
- (vi) CURRENT APPLICATION DATA:
  - (A) APPLICATION NUMBER: US 08/468,337
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  - (C) CLASSIFICATION: 424
- (vii) PRIOR APPLICATION DATA:
  - (A) APPLICATION NUMBER: DE P 41 23 760.9
  - (B) FILING DATE: 18-JUL-1991
- (viii) ATTORNEY/AGENT INFORMATION:
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  - (C) REFERENCE/DOCKET NUMBER: 05552-1199-02000
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(2) INFORMATION FOR SEQ ID NO:1:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 45 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:1:

Ala Ile Ser Asp Asp Glu Asn Glu Asn Asp Ser Asp Thr Gly Glu Asp  
20 25 30

(2) INFORMATION FOR SEQ ID NO:2:

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:2:

Asn Asp

(2) INFORMATION FOR SEQ ID NO:3:

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:3:

Gly Trp Phe Tyr Val Glu Ala Val Val Glu Lys Lys Thr Gly Asp Ala  
20 25 30

Ile Ser Asp Asp Glu Asn Glu Asn Asp Ser Asp Thr Gly Glu Asp Leu

Val Asp Phe Ile Val Asn Asp Asn Asp Tyr Leu Thr  
 50 55 60

(2) INFORMATION FOR SEQ ID NO:4:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 15 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:4:

Glu Asp Leu Val Asp Phe Ile Val Asn Asp Asn Asp Tyr Leu Thr  
 1 5 10 15

(2) INFORMATION FOR SEQ ID NO:5:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 34 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:5:

Glu Asp Leu Val Asp Phe Ile Val Asn Asp Asn Asp Tyr Leu Thr Gln  
 1 5 10 15

Ala Glu Thr Glu Thr Ala His Ala Leu Phe Thr Ala Gln Glu Ala Lys  
 20 25 30

Gln His

(2) INFORMATION FOR SEQ ID NO:6:

- (i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 54 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

[illegible]

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 8 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:7:

Gly Ser Pro Leu Ser Asp Ile Ser  
1 5

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 11 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:8:

Asp Lys Ile Leu Thr His Tyr Glu Asn Asp Ser  
1 5 10

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 18 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

Asp Lys Ile Leu Thr His Tyr Glu Asn Asp Ser Thr Asp Leu Arg Asp  
1                   5                   10                   15  
His Ile

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 11 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

Asp Leu Arg Asp His Ile Asp Tyr Trp Lys His  
1 5 10

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 23 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

Ala Ile Tyr Tyr Lys Ala Arg Glu Met Gly Phe Lys His Ile Asn His  
1 5 10 15

Gln Val Val Pro Thr Leu Ala  
20

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 30 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:12:

Ala Ile Tyr Tyr Lys Ala Arg Glu Met Gly Phe Lys His Ile Asn His  
1 5 10 15  
Gln Val Val Pro Thr Leu Ala Val Ser Lys Asn Lys Ala Leu  
20 25 30

(2) INFORMATION FOR SEQ ID NO:13:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 25 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:13:

Tyr Tyr Lys Ala Arg Glu Met Gly Phe Lys His Ile Asn His Gln Val  
1 5 10 15  
Val Pro Thr Leu Ala Val Ser Lys Asn  
20 25

(2) INFORMATION FOR SEQ ID NO:14:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 20 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:14:

Ile Asn His Gln Val Val Pro Thr Leu Ala Val Ser Lys Asn Lys Ala  
1 5 10 15  
Leu Gln Ala Ile  
20

(2) INFORMATION FOR SEQ ID NO:15:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 17 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:15:

Ile Asn His Gln Val Val Pro Thr Leu Ala Val Ser Lys Asn Lys Ala  
1                      5                      10                      15  
Leu

(2) INFORMATION FOR SEQ ID NO:16:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 37 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:16:

Thr Leu Ala Val Ser Lys Asn Lys Ala Leu Gln Ala Ile Glu Leu Gln  
1                      5                      10                      15  
Leu Thr Leu Glu Thr Ile Tyr Asn Ser Gln Tyr Ser Asn Glu Lys Trp  
                    20                      25                      30  
Thr Leu Gln Asp Val  
                    35

(2) INFORMATION FOR SEQ ID NO:17:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 25 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:17:

Gln Leu Thr Leu Glu Thr Ile Tyr Asn Ser Gln Tyr Ser Asn Glu Lys  
1                      5                      10                      15  
Trp Thr Leu Gln Asp Val Ser Leu Glu  
                    20                      25

(2) INFORMATION FOR SEQ ID NO:18:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 14 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:18:

Thr Leu Glu Thr Ile Tyr Asn Ser Gln Tyr Ser Asn Glu Lys  
1 5 10

(2) INFORMATION FOR SEQ ID NO:19:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 15 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:19:

Thr Ser Val Phe Ser Ser Asn Glu Val Ser Ser Pro Glu Ile Ile  
1 5 10 15

(2) INFORMATION FOR SEQ ID NO:20:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 36 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:20:

Val Phe Ser Ser Asn Glu Val Ser Ser Pro Glu Ile Ile Arg Gln His  
1 5 10 15

Leu Ala Asn His Pro Ala Ala Thr His Thr Lys Ala Val Ala Leu Gly  
20 25 30

Thr Glu Glu Thr  
35

(2) INFORMATION FOR SEQ ID NO:21:



(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 37 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:21:

Glu	Ile	Ile	Arg	Gln	His	Leu	Ala	Asn	His	Pro	Ala	Ala	Thr	His	Thr
1				5					10					15	
Lys	Ala	Val	Ala	Leu	Gly	Thr	Glu	Glu	Thr	Gln	Thr	Thr	Ile	Gln	Arg
			20					25						30	
Pro	Arg	Ser	Glu	Pro											
			35												

(2) INFORMATION FOR SEQ ID NO:22:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 19 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:22:

Thr	Glu	Glu	Thr	Gln	Thr	Thr	Ile	Gln	Arg	Pro	Arg	Ser	Glu	Pro	Asp
1				5					10					15	
Thr	Gly	Asn													

(2) INFORMATION FOR SEQ ID NO:23:

(i) SEQUENCE CHARACTERISTICS:  
 (A) LENGTH: 10 amino acids  
 (B) TYPE: amino acid  
 (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:23:

Glu	Asp	Leu	Val	Asp	Phe	Ile	Val	Asn	Asp
1				5					10

(2) INFORMATION FOR SEQ ID NO:24:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 17 amino acids  
    (B) TYPE: amino acid  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:24:

Ser Thr Gly Ser Lys Thr Lys Val Phe Gly Ser Pro Leu Ser Asp Ile  
1                    5                    10                    15

Ser

(2) INFORMATION FOR SEQ ID NO:25:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 51 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: double  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:25:

TTGTCATGGG ATCTGAATTC CGGGGGGATC CGTCGACCTG CAGCCAAGCT T

51

(2) INFORMATION FOR SEQ ID NO:26:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 17 amino acids  
    (B) TYPE: amino acid  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:26:

Leu Ser Trp Asp Leu Asn Ser Gly Gly Ile Arg Arg Pro Ala Ala Lys  
1                    5                    10                    15

Leu

(2) INFORMATION FOR SEQ ID NO:27:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 42 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:27:

TTGTCATGGG ATCTGAATTC CGGGGGGATC CGTCGACCTG CA

42

(2) INFORMATION FOR SEQ ID NO:28:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 14 amino acids
  - (B) TYPE: amino acid
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:28:

Leu	Ser	Trp	Asp	Leu	Asn	Ser	Gly	Gly	Ile	Arg	Arg	Pro	Ala
1				5					10				

(2) INFORMATION FOR SEQ ID NO:29:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 33 base pairs
  - (B) TYPE: nucleic acid
  - (C) STRANDEDNESS: double
  - (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:29:

GGTACCAATG GGGAAGAGGG TACGGGATGT AAT

33

(2) INFORMATION FOR SEQ ID NO:30:

- (i) SEQUENCE CHARACTERISTICS:
  - (A) LENGTH: 12 amino acids
  - (B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:30:

Ala Gly Thr Asn Gly Glu Glu Gly Thr Gly Cys Asn  
1 5 10

(2) INFORMATION FOR SEQ ID NO:31:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 75 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:31:

TTGTCATGGG ATCTGAATTC CGGGGGGATC CGTCGACCTG CAGGTACCAA TGGGGAAGAG  
GGTACGGGAT GTAAT

60

75

(2) INFORMATION FOR SEQ ID NO:32:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 25 amino acids

(B) TYPE: amino acid

(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:32:

Leu Ser Trp Asp Leu Asn Ser Gly Gly Ile Arg Arg Pro Ala Gly Thr  
1 5 10 15  
Asn Gly Glu Glu Gly Thr Gly Cys Asn  
20 25

(2) INFORMATION FOR SEQ ID NO:33:

(i) SEQUENCE CHARACTERISTICS:

(A) LENGTH: 26 base pairs

(B) TYPE: nucleic acid

(C) STRANDEDNESS: double  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:33:

TTGTCATGGG ATCTGAATTC CGGGGG

26

(2) INFORMATION FOR SEQ ID NO:34:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:34:

Leu Ser Trp Asp Leu Asn Ser Gly Gly Ile  
1                      5                      10

(2) INFORMATION FOR SEQ ID NO:35:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 30 base pairs  
(B) TYPE: nucleic acid  
(C) STRANDEDNESS: double  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:35:

TTGTCATGGG ATCTGAATTC CGGGGGGATC

30

(2) INFORMATION FOR SEQ ID NO:36:

(i) SEQUENCE CHARACTERISTICS:  
(A) LENGTH: 10 amino acids  
(B) TYPE: amino acid  
(D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:36:

Leu Ser Trp Asp Leu Asn Ser Gly Gly Ile  
1                      5                      10

(2) INFORMATION FOR SEQ ID NO:37:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 27 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:37:

ACTCTTTGCC AACGTTTAAA TGTGTGT

27

(2) INFORMATION FOR SEQ ID NO:38:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 9 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:38:

Thr Leu Cys Gln Arg Leu Asn Val Cys  
1                      5

(2) INFORMATION FOR SEQ ID NO:39:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 57 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:39:

TTGTCATGGG ATCTGAATTC CGGGGGGATC ACTCTTTGCC AACGTTTAAA TGTGTGT

57

(2) INFORMATION FOR SEQ ID NO:40:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 19 amino acids  
    (B) TYPE: amino acid  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:40:

Leu Ser Trp Asp Leu Asn Ser Gly Gly Ile Thr Leu Cys Gln Arg Leu  
1                    5                    10                    15  
Asn Val Cys

(2) INFORMATION FOR SEQ ID NO:41:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 30 base pairs  
    (B) TYPE: nucleic acid  
    (C) STRANDEDNESS: double  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:41:

GACTATTATG GTTTATATTA TGTTTCATGAA

(2) INFORMATION FOR SEQ ID NO:42:

- (i) SEQUENCE CHARACTERISTICS:  
    (A) LENGTH: 10 amino acids  
    (B) TYPE: amino acid  
    (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:42:

Asp Tyr Tyr Gly Leu Tyr Tyr Val His Glu  
1                    5                    10

(2) INFORMATION FOR SEQ ID NO:43:

- (i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 60 base pairs
- (B) TYPE: nucleic acid
- (C) STRANDEDNESS: double
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: DNA (genomic)

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:43:

TTGTCATGGG ATCTGAATTC CGGGGGGATC GACTATTATG GTTTATATTA TGTTTCATGAA

60

(2) INFORMATION FOR SEQ ID NO:44:

(i) SEQUENCE CHARACTERISTICS:

- (A) LENGTH: 20 amino acids
- (B) TYPE: amino acid
- (D) TOPOLOGY: linear

(ii) MOLECULE TYPE: peptide

(xi) SEQUENCE DESCRIPTION: SEQ ID NO:44:

Leu Ser Trp Asp Leu Asn Ser Gly Gly Ile Asp Tyr Tyr Gly Leu Tyr  
 1                      5                      10                      15

Tyr Val His Glu  
 20